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with the result of showing clearly the relations of the uredo- and teleutosporic forms, and affording a proper basis of classification of the two orders.

The metamorphoses of *Pyrenomyces* gave rise to a number of papers in which the connection of secondary forms as conidia, pycnidia, spermogonia, with ascosporic forms was clearly shown. On this fruitful topic, the superb illustrations have been the envy of all later botanists, and their observations on the development of ascomycetous fungi threw a flood of light on one of the most obscure corners of mycology. In this connection should be mentioned the memoir on ergot and also the "Mémoire pour servir à l'histoire organographique et physiologique des lichens" in the *Annales* of 1852, one of the most important treatises on the structure of lichens.

The complete studies of the Tulasnes on hypogæous forms appeared in 1851, when they published a folio volume, "*Fungi Hypogæi*," of which only a hundred copies were printed. This work was followed in 1861-65 by the "*Selecta Fungorum Carpologia*" in three volumes, containing an elaborate account of the different conditions of *Erysiphe*, *Pyrenomyces*, and all other ascomycetous fungi. These four volumes, which really form a single series, are most elaborately and luxuriously printed and illustrated, and are certainly unequalled, artistically considered, by any other work on fungi. They will remain a lasting monument to the memory of these two men, who were as talented as they were modest. Always courteous to their contemporaries and quick to recognize the value of their work and that of their predecessors, it is not strange that they were universally esteemed. Their lives seem almost a romance from the time when they began their botanical career as young men at Paris to their death at one of the most beautiful spots on the Mediterranean. The spirit which guided them through life and inspired them in their scientific work is indicated in the quotation which is placed at the head of the beautiful plates of the last volume of the *Carpologia*: "Non nobis, Domine, non nobis sed Nomini Tuo da gloriam."—W. G. FARLOW.

**The Grasses of Coulter's Manual.**—In his preface the author invites criticisms or corrections with the view of hastening the production of a second edition, and the remarks here offered are made with the hope that they may be of some use in the direction indicated. Being more intimately acquainted with the order Gramineæ than with the other families, these notes will be confined to this order.

The sequence of the genera of grasses is in accordance with that of Bentham and Hooker's *Genera Plantarum*, and we have here the first attempt at introducing into an American text-book that nomenclature of the parts connected with the flowers, as adopted by Bentham, designed to express their true morphological relations. The term glume is applied not only to the two lower bracts that embrace or subtend the spikelets, but also to the bract that subtends the flower which, in other American text-books, is termed the lower palea or palea. The latter term (palea) is applied only to the "upper palea" of authors, the real character of which has never been clearly demonstrated. Bentham suggested that this palea with the lodicules might represent perianth segments of an outer and inner series which, if confirmed, would justify our designating as a neutral flower that in which the palea alone or the palea and lodicules without stamens or pistils are developed; but we must not include in the flower the bract or glume which subtends it.<sup>1</sup>

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<sup>1</sup> Bentham, Notes on Gramineæ, Trans. Linn. Soc. xix., p. 24.

In characterizing the order, p. 397, the author has failed to present clearly this modification of terms by adhering too closely to the characters given in Gray's Manual. The same may be said in reference to the specific descriptions. In describing *Panicum capillare* he says, "sterile flower neutral and of a single glume." A glume in no way constitutes a "flower," and in order to conform with the nomenclature generally adopted, the expression should be "third glume empty," i. e., devoid of a palea or any of the essential organs. In the same description he calls the 2d glume the "upper one," and the 4th or flowering glume he calls a "*somewhat obtuse perfect flower*." In describing *Stipa spartea* he says the glumes, meaning the two empty ones, are longer than the "palea." One of these "palea" is called a "flowering glume" in the characterizing the genus on p. 399. Again, under *Stipa viridula*, he speaks of the "lower palea." There are other instances of lack of uniformity in the use of terms employed to designate the parts of a spikelet, but it is not necessary to refer to them, as our purpose is merely to call attention to this matter. In this connection it may be well to suggest that the expression "outer glumes," although admissible in many cases and sufficiently exact, may lead to inaccuracies or confusion if too generally used. It is understood to refer to the two lowest or the first and second glumes of the spikelet when these alone are empty glumes. When the structure of the spikelet will permit its use in this sense there may be no objection in using it, but in other cases it would be better to designate the glumes by number, as 1st, 2d, 3d, etc. In *Reimaria*, *Leersia*, *Zizania*, etc., there are only two glumes in the spikelet, and, of course, both are "outer" glumes, in a literal sense, but one of them is a flowering glume. In such cases it would hardly be correct to say that there was but one "outer" glume. On the other hand in *Panicum*, and a number of other genera, there are often three empty glumes below the flowering one. Here the use of the expression in question would lead to needless complication.

In the synopsis of genera, page 398, there are a few errors of fact or misuse of terms that call for a revision. *Beckmannia* is said to have three empty glumes and a flowering glume. In the European plant there are four glumes, the two lower ones empty while the third and fourth are flower-bearing, or the third may enclose only palea. In the American plant, so far as it has been examined, only three glumes have been discovered—the two lower ones empty, the third enclosing a perfect flower.

The genus *Panicum* is described as having only three glumes, two empty and one "fertile." Now, the most important character in distinguishing *Panicum* from *Paspalum* is the fact that in the spikelets of the former there are four glumes while the latter has but three. The same error occurs in describing *Setaria*, which in the number and character of its glumes are the same as in *Panicum*. We have here also the expression "the flowering glume with its palea." This may have been an oversight in correcting the proofs. The flowering glume in the *Andropogoneæ* is said to be "often bearded." It is often awned but never bearded. The flower in the genus *Phalaris* is stated to "consist of two glumes, sometimes called palea." There are no true palea in *Phalaris*, and it is hardly necessary to say that the stamens and pistil constitute the flower, and that the glumes are only bracts subtending it. In *Phalaris* there are five, or more often six glumes; two large, complicate outer ones, two smaller inner ones enclosing the flower and two (sometimes only one) intermediate ones which are small and lanceolate or are reduced to simple bristles.

In the synopsis, *Agrostis* and *Cinna* are separated from *Deyeuxia* by having "no bristle standing opposite the palea." In *Cinna pendula*, the only species described, the rhachilla is very often prolonged behind the palea into a short, naked bristle, and in *Agrostis humilis* Vasey, a well marked species found in Colorado, Montana, etc., there is a similar extension of the rhachilla.

No one would look for *Graphephorum flexuosum* Thurb. in *Graphephorum* as characterized on page 402, where it says "outer glumes nearly equaling the rather remote flowers." In *G. flexuosum* the outer glumes are one-half shorter

than the spikelet and the florets are usually crowded. In a former number of the GAZETTE (vol. ix. p. 169) it was stated that this grass constituted a good genus by itself distinct from *Colpodium* and *Fluminia* and still farther removed from *Graphephorum melicoides*. Its true relationship is somewhat obscure, but there can be no hesitation in placing it with the *Festuceæ*. As to *Graphephorum melicoides* and *Wolfii*, their affinities are with the *Aveneæ*. The former was first published under *Aira* and the latter under *Trisetum*.<sup>1</sup> They differ from *Trisetum* only in the less pointed lobes of the flowering glumes and in the shorter awns. *Graphephorum melicoides*, usually described as awnless, is sometimes short awned like *G. Wolfii*. So closely allied are these two species, that slender forms of the latter might easily be mistaken for the former. That this mistake has occurred is evident from the fact that Utah and Wyoming are given in the range of *G. melicoides*, where only *G. Wolfii* has, as yet, been found.

On page 403 *Panicum amarum* Ell. is described. It is exceedingly doubtful if this plant has ever been found in the interior.

*Setaria setosa*, var. *caudata* Vasey, should read *S. setosa*, var. *caudata* Griseb. (See Griseb. Flor. Br. W. Ind. p. 555.)

*Andropogon furcatus* Muhl. has an older synonym, *A. provincialis* Lam. (See Scribner, in Trans. Kansas Acad. Sci. ix. p. 116.) *A. Hallii* Hackl. Sitzb. der k. Akad. d. Wissensch. Band lxxxix. p. 127) is not an infrequent species in the Rocky Mt. region from Arizona to Montana. It is No. 651 Hall & Harbour.

*Muhlenbergia sylvatica*, var. *setiglumis* Watson (p. 409) is *M. ambigua*, Torr. in Niccolet's Rept. p. 164.

*Vilfa cuspidata* Torr. and *depauperata* Torr. were first placed in *Sporobolus* by Scribner. (See Bull. Torr. Bot. Club, ix. No. 8.)

*Aira flexuosa* Linn. is *Deschampsia flexuosa* Griseb. (Spic. ii. p. 457), and not of Beauvois.

In placing *Aira latifolia* Hook. in *Deschampsia*, a new specific name must be given, as *latifolia* is already taken. It should be called *D. Hookeriana*.

Munro never named any *Poa*, *P. Californica*. He did have a *Sclerochloa Californica*, which is abundantly distinct from the *Poa Andina* of Nuttall.

Buckley should be quoted as the author of *Poa tenuifolia* (see Proc. Acad. Phila., 1862).

*Poa arctica* (on page 422) is *P. leptocoma* Trin. *Poa arctica* Br. is *P. cnesia* All.

*Bromus brevistaratus* should be given to Buckley, who published the species under that name in 1862, twelve years before Thurber's publication.—F. LAMSON SCRIBNER.

## EDITORIAL.

THE CUSTOM, which happily is now quite general among botanical writers, at least in America, of distributing separate copies or "extras" of articles published in periodicals, reports of societies, etc., is one especially to be commended. It is mutually helpful to the author and the recipient, and places the publications directly in the hands of those who can make the best use of them, irrespective of the circulation of the medium through which first issued. It is evidently desirable that the excerpt should furnish the possessor with all the data necessary to make a proper citation from it, the same as if the volume in which it was first published were consulted. For this reason it is essential that the original paging should not be changed, and that it should bear the name

<sup>1</sup> Bot. Gaz., ix. 168.